



ALBERTA CHAPTER OF  
THE WILDLIFE SOCIETY

# Cumulative Effects and Coal Mining on the Eastern Slopes

Presentation to Coal Consultation Committee  
July 2021





## ACTWS Mission and Mandate

**Mission:** To inspire and empower wildlife management professionals to engage in science-based management and conservation of wild animals and their habitats.

### **Mandate:**

We talk wildlife – Conferences, events, website and communications

Advocate for science-based management (walk the talk) – letter writing

Cultivate new biologists – student chapters, mixers, scholarships



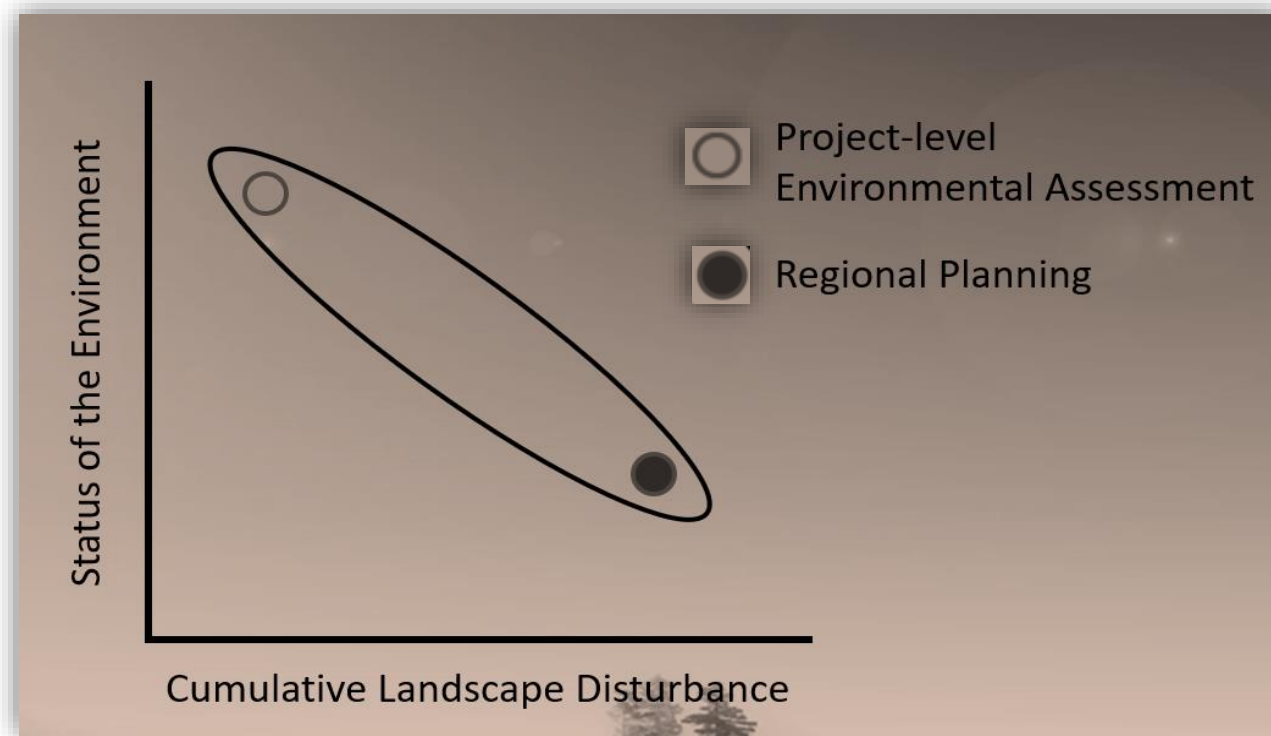
# High Level Concerns

1. Cumulative effects
2. Habitat impacts – fragmentation, declining quality, loss of connectivity
3. Species at risk (e.g., trout and grizzly bears)



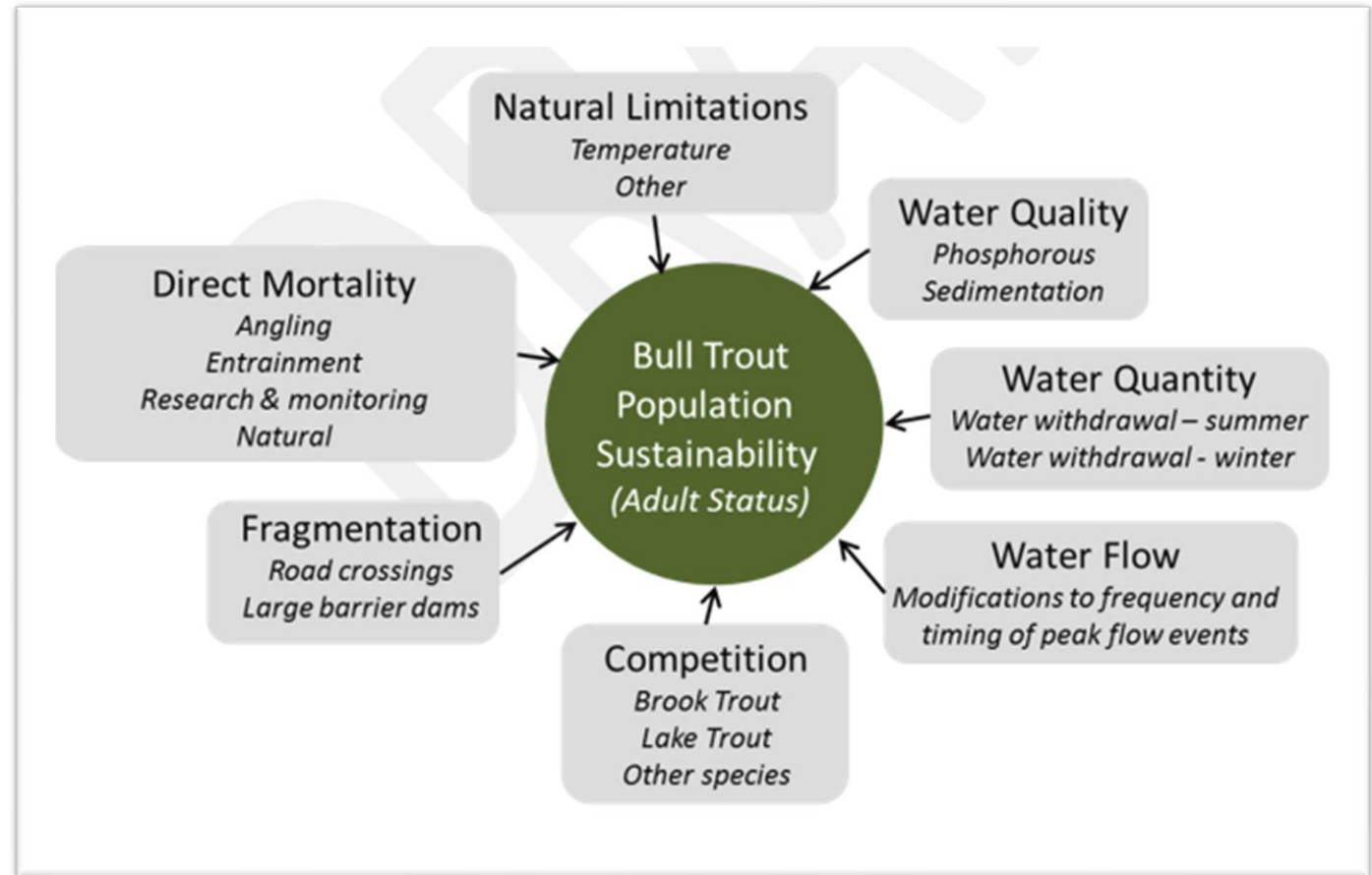
# Cumulative Effects

**Key concept:** small individual impacts can combine over space and time to cause large changes to the environment



# ACTWS Cumulative Effects Assessment

- Cumulative Effects of Land Uses and Conservation Priorities in Alberta's Southern East Slopes Watersheds
- Explore an alternative scenario to "business as usual" and use it to identify priority areas for trout conservation.



# Methods

## Step1

- **Estimate the current landscape composition**
- Derived from the integration of multiple land cover products

## Step2

- **Simulate plausible future land use scenarios**
- *Business as Usual*: land use trajectories based on the best available information from industry, government, and other sources
- *Protection*: future land use excluded & temporary footprints reclaimed

## Step3

- **Apply indicator relationships to future (simulated) landscape dynamics**
- Link the Joe Model to the ALCES model to understand how key metrics are changing over time under different scenarios

# Key Indicators

Total  
Anthropogenic  
Disturbance

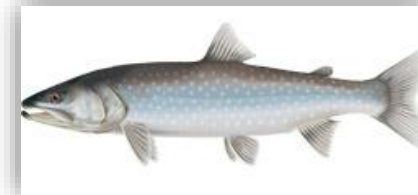
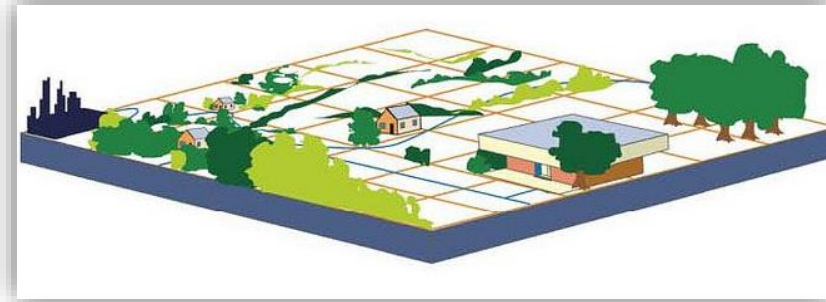
- conveys landscape change

Equivalent  
Clearcut Area  
(ECA)

- conveys impacts to hydrology

Fish  
Sustainability  
Index (FSI)

- conveys impacts to trout





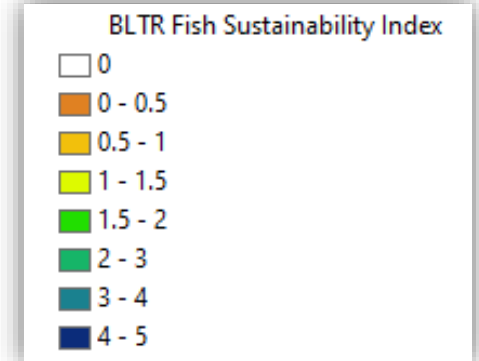
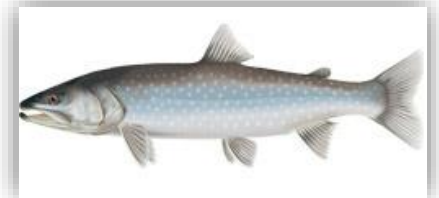
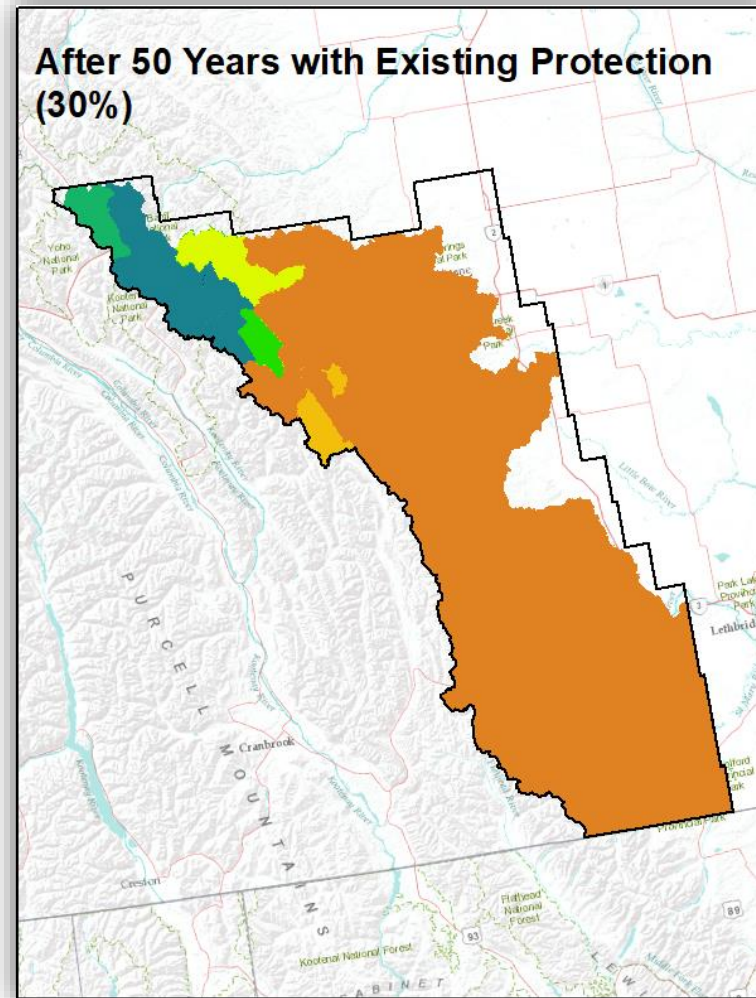
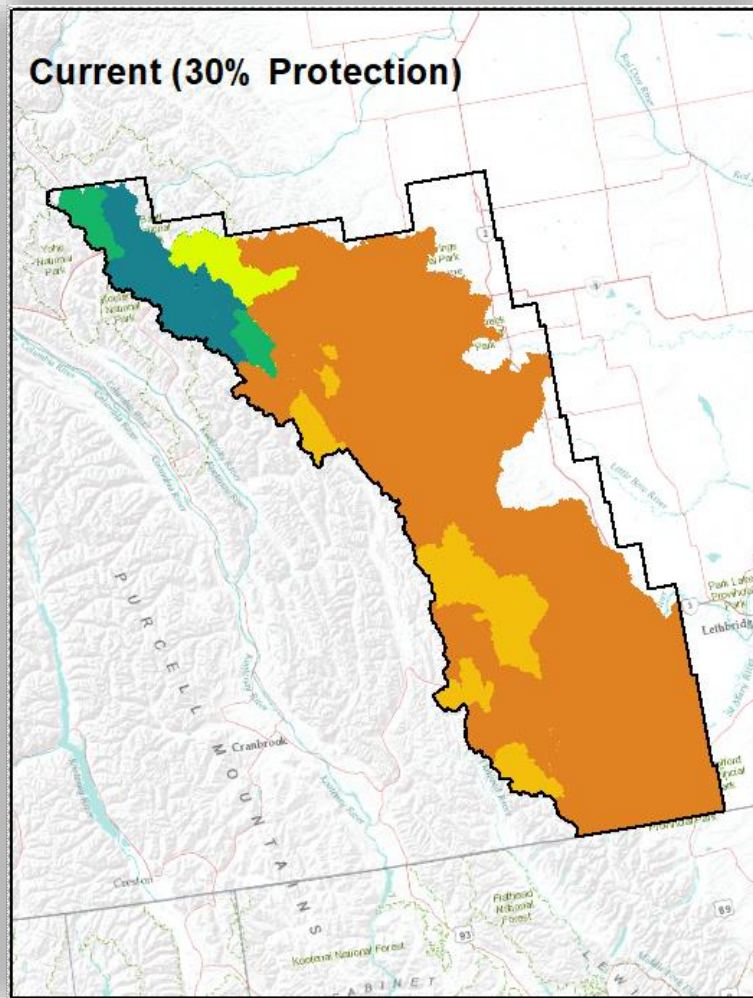
# Watershed Prioritization



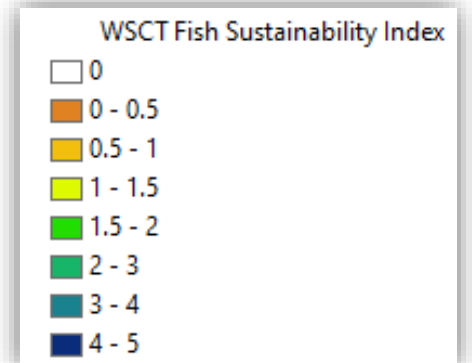
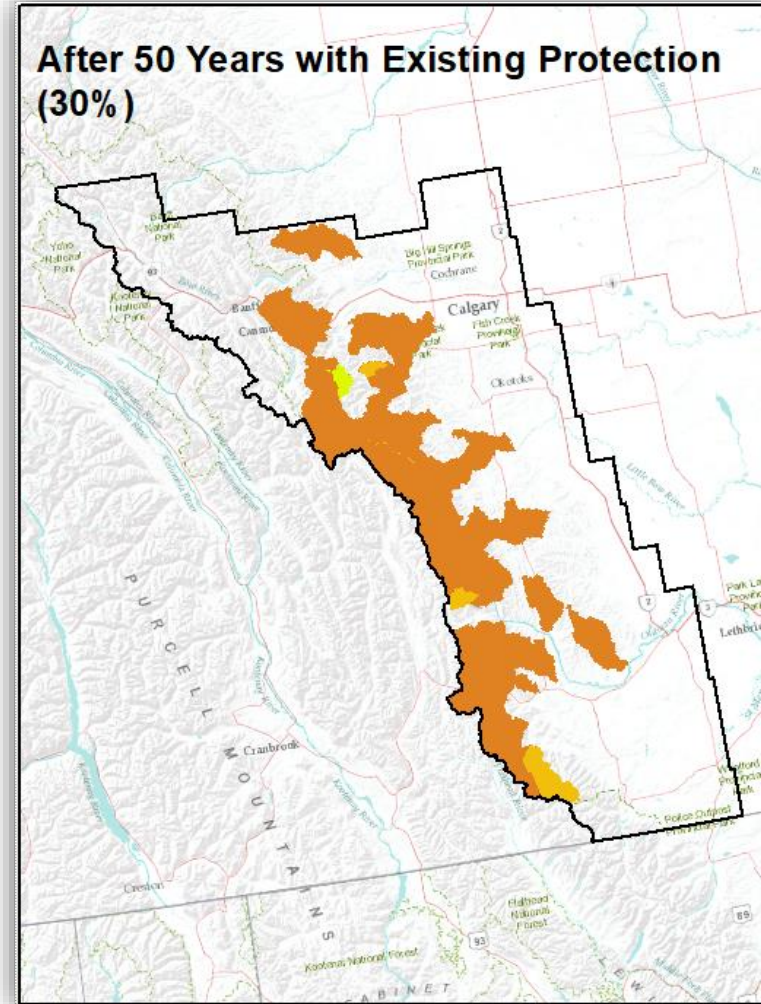
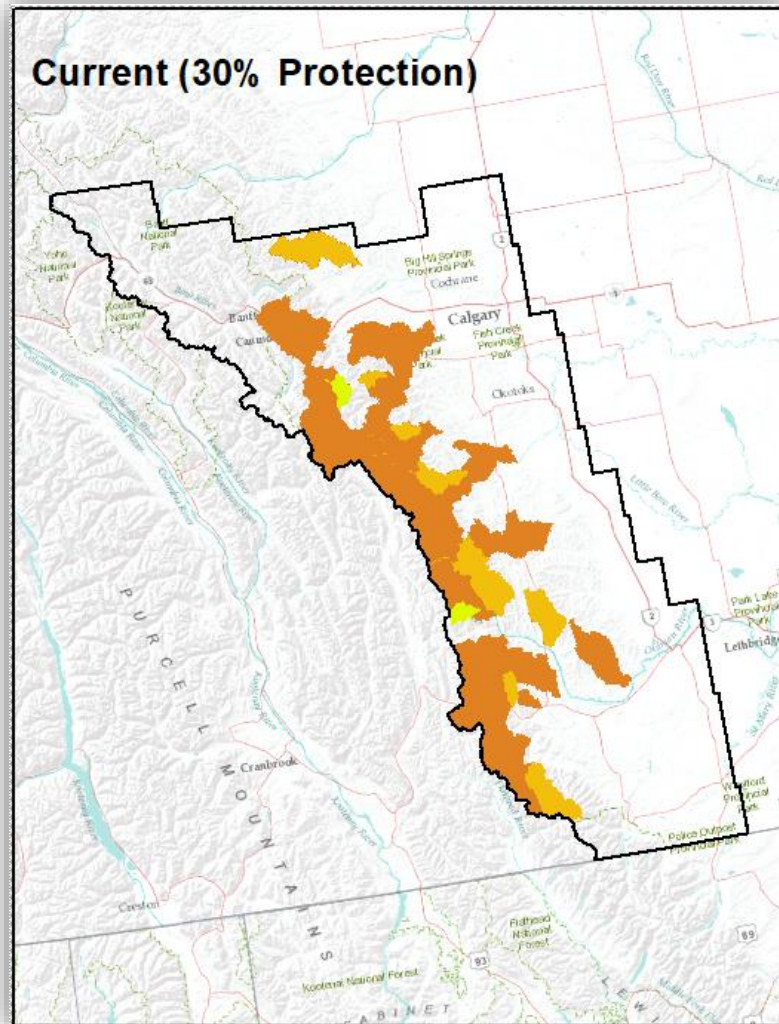
- Conservation effectiveness = FSI gain
- Conservation cost = natural resource GDP loss
- Conservation cost-effectiveness = 
$$\frac{FSI\ gain}{NR\ GDP\ loss}$$
- Watersheds were prioritized for conservation based on average cost-effectiveness for trout across the five decades of simulation



# Business as usual: Bull Trout FSI



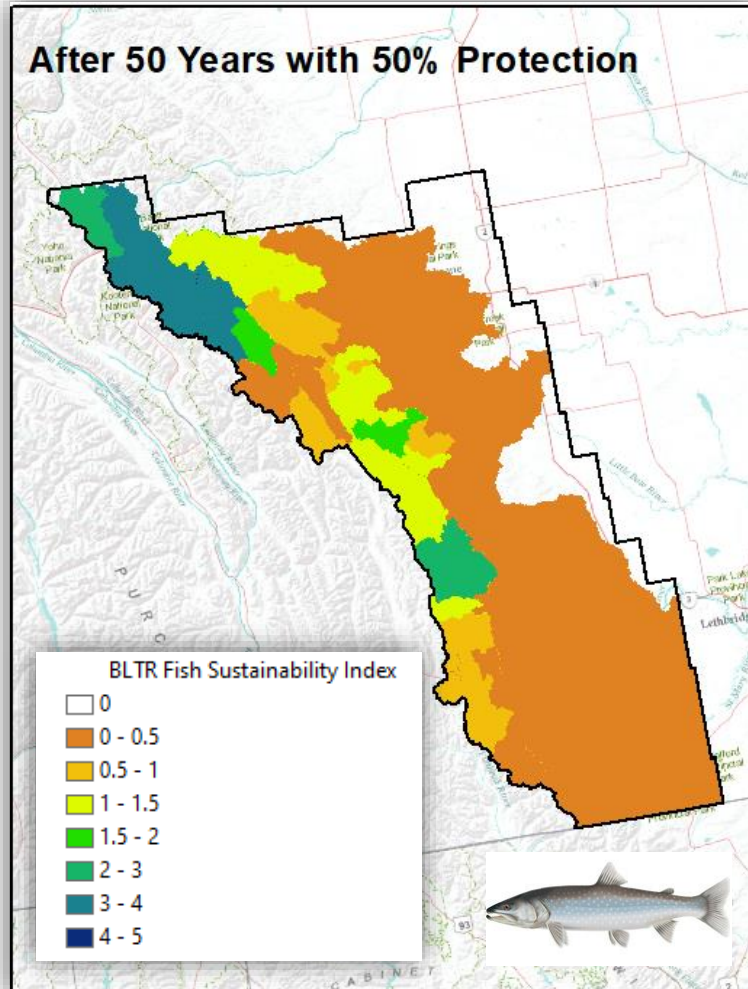
# Business as Usual Westslope Cutthroat Trout FSI



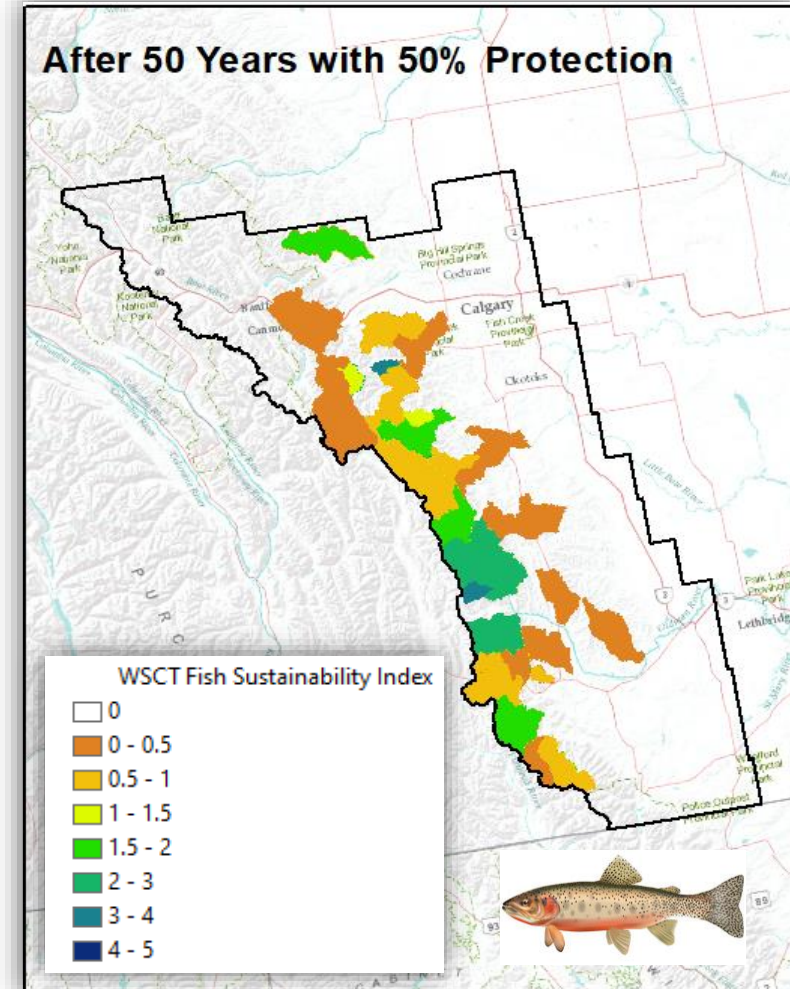


# Protection

## Bull Trout



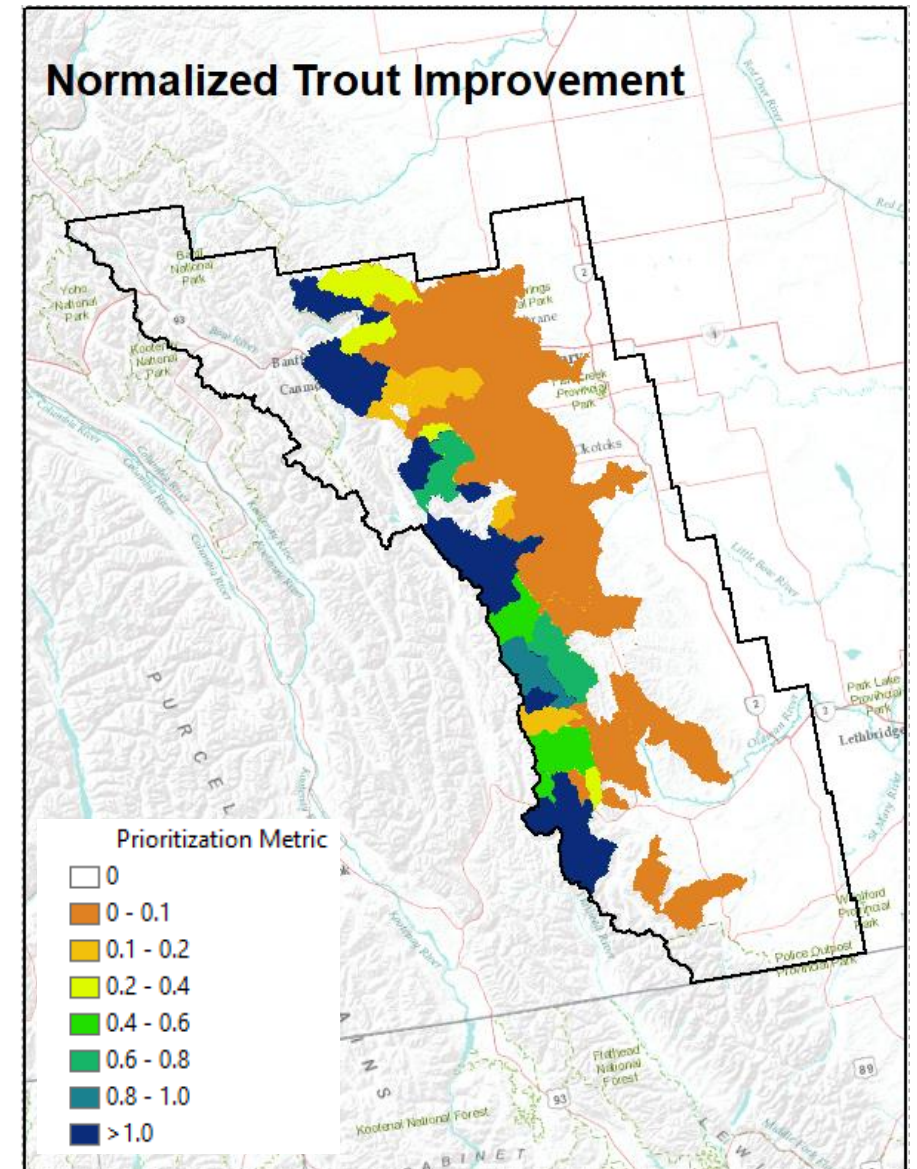
## Westslope Cutthroat Trout



# Watershed Prioritization

Western watersheds exhibit the greatest conservation potential for trout:

- Greater natural potential
- Greater reclamation potential
- Greater resiliency to climate change
- Greater reduction in hydrological impact (ECA)





# Problems with some Cumulative Effects Assessments

The temporal time frame of the cumulative effects assessment is inadequate.

The cumulative effects assessment in the EIA does not model additive effects of land uses in the study area effectively.

Existing and future recreation impacts are not adequately considered or added to industrial impacts.





# Habitat Impacts – Loss and Fragmentation

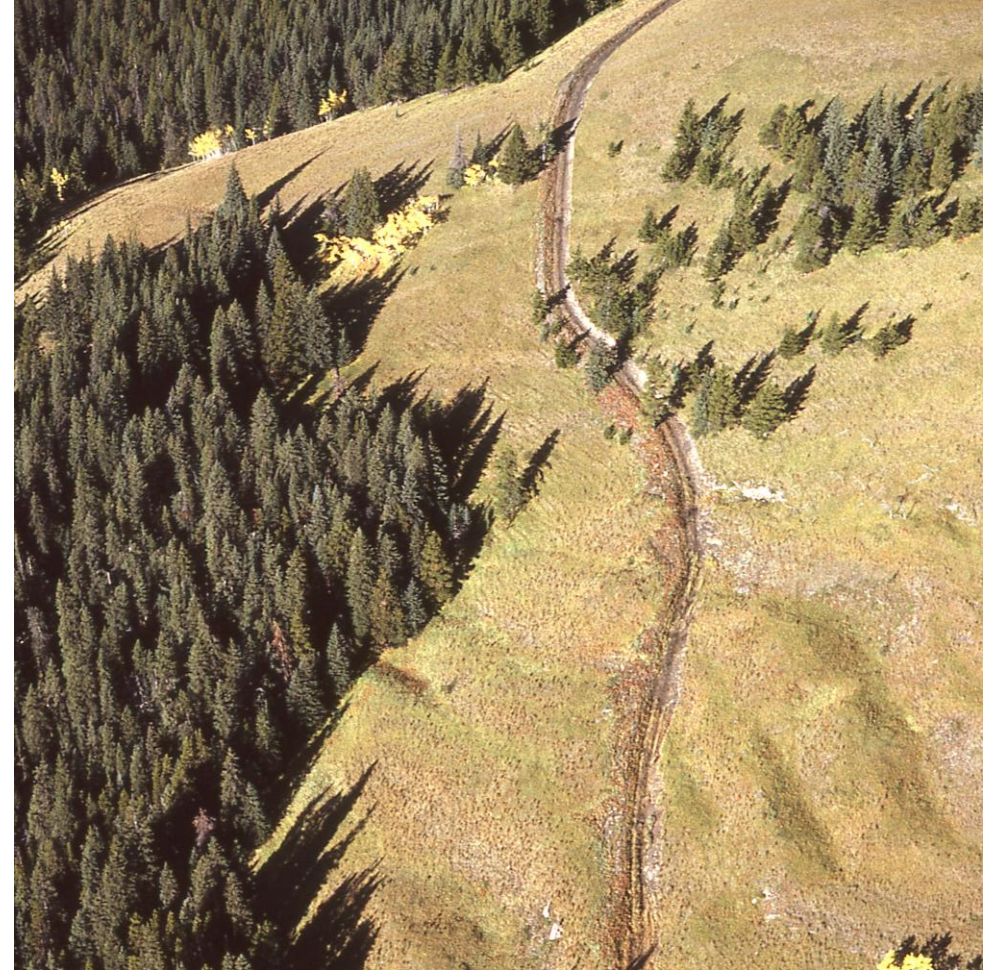
Affects multiple species

Reclamation may be challenging and may not be successful in providing habitat for the same species to return.

Species generation time as it relates to habitat reclamation is important.

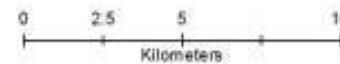
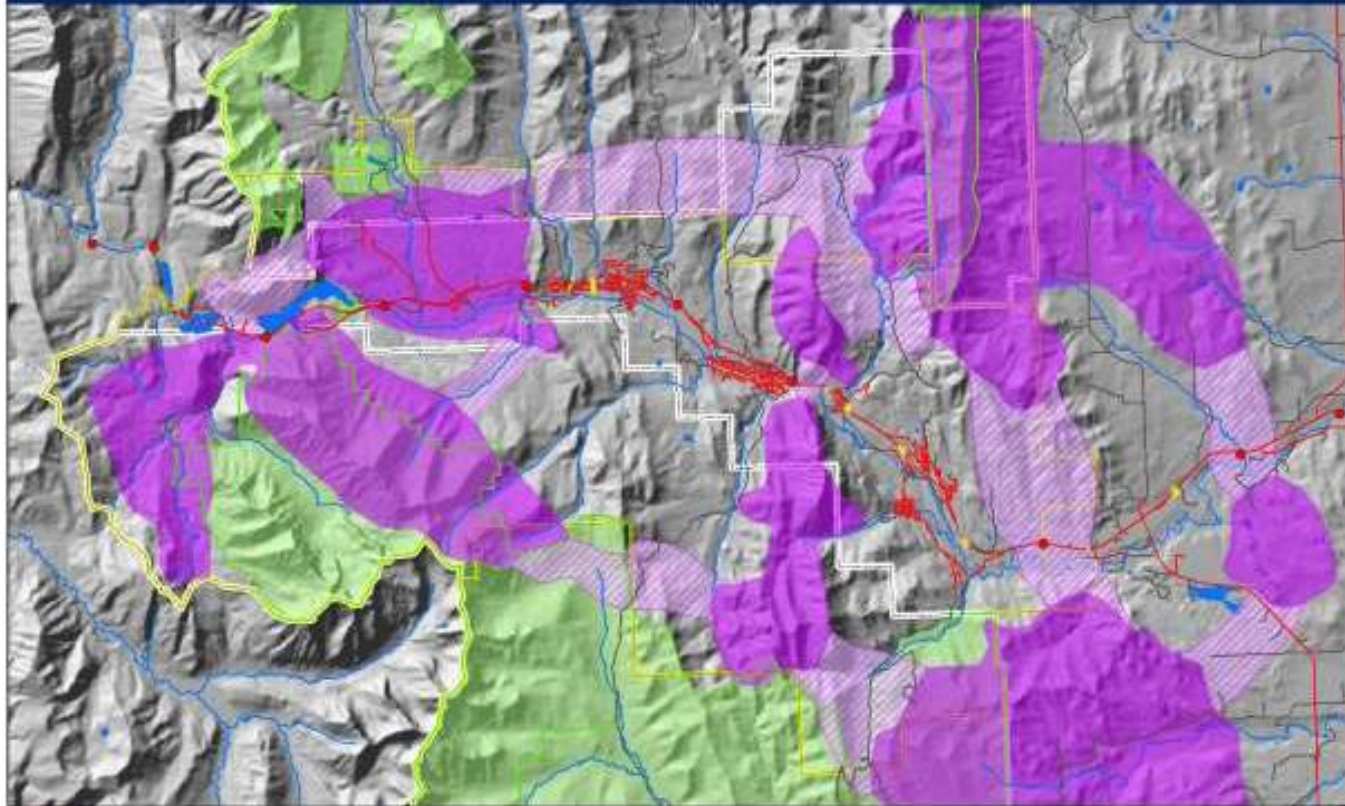


# Habitat Impacts – Linear Disturbance





## HABITAT PATCHES AND WILDLIFE CORRIDORS



# Habitat impacts – Connectivity

Maps based on human and wildlife data identify habitat patches and potential wildlife corridors.

Development should avoid habitat patches and be planned in ways that don't impede connectivity.



# Species at Risk





# Recommendations to the Coal Consultation Committee

Reclamation standards need to be higher, transparent, and achievable.

Monitoring of all mining activities need to extend for at least 10 years beyond mine operations and be conducted under an adaptive management context.

Cumulative effects assessments need to be part of exploration and development proposals.

Climate change impacts and projections need to be included in any CEA.

Any policy should consider that intact landscapes retain their integrity.

The coal policy needs to ensure alignment with other policies and regional plans.

# Recommendations for the Coal Consultation Committee

Use the results from previous public consultation efforts regarding land use management of the Eastern Slopes.

Coal mining should not be conducted in any place or in any way that compromises habitat for species at risk.

Health of headwaters need to be the priority.

Coal mining projects should not preclude other environmental or economic projects on the landscape.



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# Thank you

